

November 6, 2002

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| Set | Items    | Description  |
|-----|----------|--|
| S1  | 230      | PHASE(2N)CONJUGAT?   |
| S2  | 13019122 | PROBE? OR PROBING OR INTERROGAT? OR EXPLOR? OR INVESTIGAT?<br>OR INSPECT? OR PENETRAT? OR PROD?  |
| S3  | 380220   | BEAM? OR LASER? OR LIGHT(2N) (PULS? OR MODULAT?) OR MASER? -<br>OR QUANTUM(2N)ELECTRONIC? OR OPTICAL(2N) (PUMP? OR GENERAT? OR<br>MODULAT? OR OSCILLATOR?) OR IRASER? OR QUANTUM()GENERATOR? |
| S4  | 255      | INTRACAVIT? OR INTRA()CAVIT?   |
| S5  | 23544    | S2(3N)S3   |
| S6  | 10       | S5(S)S1  |
| S7  | 10       | RD (unique items)  |
| S8  | 0        | S1(S)S2(S)S3(S)S4  |

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7/3,K/1 (Item 1 from file: 370)  
DIALOG(R) File 370:Science  
(c) 1999 AAAS. All rts. reserv.

00501559 (USE 9 FOR FULLTEXT)  
**Spontaneous Oscillation and Self-Pumped Phase Conjugation in a  
Photorefractive Polymer Optical Amplifier**  
Grunnet-Jepsen, A.; Thompson, C. L.; Moerner, W. E.;  
Department of Chemistry and Biochemistry, University of California, San  
Diego, CA 92093-0340, USA.  
Science Vol. 277 5325 pp. 549  
Publication Date: 7-25-1997 (970725) Publication Year: 1997  
Document Type: Journal ISSN: 0036-8075  
Language: English  
Section Heading: Reports  
Word Count: 2588

(THIS IS THE FULLTEXT)

...Text: resulting in spontaneous oscillation (B13) . The configuration  
may also be regarded as a self-pumped **phase - conjugate** mirror as  
described below...

...now show that the same multilayer approach can be adopted to increase  
the (Gamma) L **product** during two- **beam** coupling in a PR material. For  
this case, the theoretical analysis is even simpler. Two...A " **phase -  
conjugate** " beam, I.inf(4) (Fig. 4, solid line), appears counterpropagating  
to the incoming pump (Fig...

...the same time. The physics responsible for the appearance of this beam  
requires explanation. Optical **phase - conjugation** has fascinated  
scientists for almost 50 years (B18) . Popularly referred to as "time  
reversal," a **phase - conjugate** (PC) replica of an optical beam will  
propagate through space with the complex **conjugate phase** of the  
original beam, which may be viewed as propagation backward in time. Thus,  
the **Phase conjugation** is produced when two counterpropagating pump beams  
intersect in a nonlinear material; a third beam incident will generate its  
PC replica. The early demonstrations of **phase conjugation** used a  
time-consuming process of holographic recording, development, and reading  
with carefully aligned counterpropagating plane reference waves.  
Subsequently, dynamic (real-time) **phase conjugation** was demonstrated  
with stimulated Brillouin scattering (B21) and four-wave mixing in a  
nonlinear optical material (B22) . A major advance was the development of  
the self-pumped **phase conjugator** (SPPC) (B23) , which required a PR  
material. This device does not require a pair of...

...increases rapidly until it reaches a threshold value for the onset of  
cavity oscillation and **phase conjugation** . Above the threshold, the  
two-beam coupling gain exceeds the total optical losses of about...  
mW/cm.sup(2) ( (triangle-solid) ) and 90 mW/cm.sup(2) ( (open-circle) ). No  
**phase conjugation** was observed below the threshold of ~45 V/ (mu) m.  
(Inset) Experimental arrangement for the...

7/3,K/2 (Item 1 from file: 636)  
DIALOG(R) File 636:Gale Group Newsletter DB(TM)  
(c) 2002 The Gale Group. All rts. reserv.

02999474 Supplier Number: 46117431 (USE FORMAT 7 FOR FULLTEXT)  
**OPTOELECTRONICS:Phase-Conjugate Mirror Removes Distortions**  
Optical Materials & Engineering News, v6, n6, pN/A  
Feb 1, 1996  
Language: English Record Type: Fulltext  
Document Type: Newsletter; Trade  
Word Count: 574

November 6, 2002

**Phase - conjugate** mirrors could be used to prevent the degradation of a laser beam amplified to higher power in multiple laser stages. Each stage can introduce aberrations into the beam. **Phase - conjugate** mirrors can help users obtain high-power laser beams of diffraction-limited quality. One proposed...

...laser system for an earth-observing satellite. This instrument will include compact, efficient, solid-state **lasers** that will **produce** pulses of 20-250 millijoules lasting 0.1-50.0 nanoseconds. Multistage power amplification, with...

...as high as 60% were achieved.

In the experiment, the cross-sectional area of a **phase - conjugate beam produced** by photorefractive four-wave mixing was compared with that of the return from a conventional mirror after passing through the aberrating medium. The **phase - conjugate** beam was returned with a cross-sectional area equal to that of the unaberrated beam...

7/3,K/3 (Item 2 from file: 636)  
DIALOG(R)File 636:Gale Group Newsletter DB(TM)  
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01075265 Supplier Number: 40675386 (USE FORMAT 7 FOR FULLTEXT)  
**The Naval Research Laboratory**  
SDI Monitor, v4, n3, pN/A  
Feb 6, 1989  
Language: English Record Type: Fulltext  
Document Type: Magazine/Journal; Trade  
Word Count: 114

(USE FORMAT 7 FOR FULLTEXT)  
TEXT:  
The Naval Research Laboratory wants to **investigate** Raman **beam** clean-up and **phase conjugation** .

7/3,K/4 (Item 3 from file: 636)  
DIALOG(R)File 636:Gale Group Newsletter DB(TM)  
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01071441 Supplier Number: 40661151 (USE FORMAT 7 FOR FULLTEXT)  
**NRL TO INVESTIGATE RAMAN BEAM CLEANUP**  
SDI Intelligence Report, v5, n3, pN/A  
Jan 31, 1989  
Language: English Record Type: Fulltext  
Document Type: Magazine/Journal; Trade  
Word Count: 126

(USE FORMAT 7 FOR FULLTEXT)  
TEXT:  
The Naval Research Laboratory (NRL) plans an **investigation** of Raman **beam** cleanup and **phase conjugation** . Tasks include the following:

7/3,K/5 (Item 4 from file: 636)  
DIALOG(R)File 636:Gale Group Newsletter DB(TM)  
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01070950 Supplier Number: 40660148 (USE FORMAT 7 FOR FULLTEXT)  
**Raman Beam Clean-Up.**  
Navy News & Undersea Technology, v6, n4, pN/A  
Jan 30, 1989  
Language: English Record Type: Fulltext

November 6, 2002

Document Type: Newsletter; Trade  
Word Count: 96

(USE FORMAT 7 FOR FULLTEXT)

TEXT:

...Naval Research Laboratory needs a contractor to perform the following tasks in conjunction with the **investigation** of Raman **beam** clean-up and **phase conjugation** : characterize the operation of Karl Subscale Laser under injection locked conditions; operate the laser in conjunction with the Raman beam clean-up experiments; conduct experiments on Raman beam clean-up, **phase conjugation** to investigate wavefront preservation in Raman amplifier. Respond by Feb. 25. For information call Pat...

7/3,K/6 (Item 5 from file: 636)

DIALOG(R)File 636:Gale Group Newsletter DB(TM)  
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01070937 Supplier Number: 40660112 (USE FORMAT 7 FOR FULLTEXT)

**UNTITLED ARTICLE**

Military Space, pN/A

Jan 30, 1989

Language: English Record Type: Fulltext

Document Type: Newsletter; Trade

Word Count: 75

(USE FORMAT 7 FOR FULLTEXT)

TEXT:

Naval Research Laboratory wants to **investigate** Raman **beam** clean-up and **phase conjugation** .

7/3,K/7 (Item 1 from file: 484)

DIALOG(R)File 484:Periodical Abs Plustext  
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02001315 (USE FORMAT 7 OR 9 FOR FULLTEXT)

**Multiplex spectroscopy: Determining the transition moments and absolute concentrations of molecular species**

Germann, Geoffrey J; Rakestraw, David J

Science (GSCI), v264 n5166, p1750-1753, p.4

Jun 17, 1994

ISSN: 0036-8075

JOURNAL CODE: GSCI

DOCUMENT TYPE: Feature

LANGUAGE: English

RECORD TYPE: Fulltext; Abstract

WORD COUNT: 2538

LENGTH: Long (31+ col inches)

TEXT:

... provide omega sub b , the backward pump beam in the DFWM process. The other IR **beam** , Op, the **probe beam** , is allowed to continue out of the sample cell and is directed into an IR...

...a function of wavelength This value provides the absorption spectrum in the experiment (7). The **phase conjugate** DFWM signal beam, omega sub s , is generated counter-propagating to omega sub p . The...function corrects for any decrease in the DFWM signal resulting from absorption of the pump, **probe** , and signal **beams** by the gas sample. The intensity of the beams is kept low to avoid optical...

7/3,K/8 (Item 2 from file: 484)

DIALOG(R)File 484:Periodical Abs Plustext  
(c) 2002 ProQuest. All rts. reserv.

01841319 (USE FORMAT 7 OR 9 FOR FULLTEXT)

November 6, 2002

**Researchers try to build time machines for microwaves**

Glanz, James

Science (GSCI), v263 n5145, p321-322, p.2

Jan 21, 1994

ISSN: 0036-8075

JOURNAL CODE: GSCI

DOCUMENT TYPE: News

LANGUAGE: English

RECORD TYPE: Fulltext; Abstract

WORD COUNT: 1724

LENGTH: Long (31+ col inches)

**TEXT:**

... planes, thereby "brightening" the targets seen by the radar system by orders of magnitude.

Microwave **phase conjugation** could also be a key to visionary schemes for collecting solar energy in space, then...

...microwave beams. To target the intense microwaves precisely, the ground station would send up a **probe beam**; the solar collector would respond with a vastly more powerful **phase - conjugated** beam. Without **phase conjugation**'s pinpoint accuracy, says physicist Norman Rostoker of the University of California, Irvine, who has...

7/3,K/9 (Item 3 from file: 484)

DIALOG(R)File 484:Periodical Abs Plustext

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01470948 (USE FORMAT 7 OR 9 FOR FULLTEXT)

**Boundary layer profiles in plasma chemical vapor deposition**

Green, David S; Owano, Thomas G; Williams, Skip; Goodwin, David G; et al

Science (GSCI), v259 n5102, p1726-1729, p.4

Mar 19, 1993

ISSN: 0036-8075

JOURNAL CODE: GSCI

DOCUMENT TYPE: Feature

LANGUAGE: English

RECORD TYPE: Fulltext; Abstract

WORD COUNT: 2522

LENGTH: Long (31+ col inches)

**TEXT:**

... Boltzmann distribution (10, 13).

The experimental setup for our DFWM experiment is known as the **phase conjugate** geometry (1, 2). The laser source is a conventional neodymium:yttrium-aluminum-garnet pumped dye...

...intensities in excess of saturation). Both the forward pump beam I sub f and the **probe beam** I sub p are vertically polarized, while the backward pump beam I sub b is...

...500 mum. The conjugate beam I sub c, the DFWM signal, is extracted from the **probe beam** path with a 1:1 beam splitter, passed through a linear polarizer and spatial filter...

7/3,K/10 (Item 4 from file: 484)

DIALOG(R)File 484:Periodical Abs Plustext

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01171738 (USE FORMAT 7 OR 9 FOR FULLTEXT)

**Detection of Trace Molecular Species Using Degenerate Four-Wave Mixing**

Farrow, Roger L; Rakestraw, David J

Science (GSCI), v257 n5078, p1894-1900, p.7

Sep 25, 1992

ISSN: 0036-8075

JOURNAL CODE: GSCI

DOCUMENT TYPE: Feature

LANGUAGE: English

RECORD TYPE: Fulltext; Abstract

WORD COUNT: 4692

LENGTH: Long (31+ col inches)

November 6, 2002

TEXT:

... intensity with a computer. At this point a beam splitter is used to produce the **probe** and forward pump **beams**, which are crossed at a small angle (typically 1 deg to 4 deg) and intersect in the medium to be studied. A second beam splitter placed in the **probe beam** path is used to extract the **phase conjugate** signal. The signal beam is directed to a convenient detection location often several meters away...

...1 where the NO concentrations were estimated to be  $\approx 400$  ppm (6). The pump and **probe laser beams** were unfocused but collimated, with beam diameters of  $\approx 1$  mm and relatively modest pulse energies...that are (most nearly) resonant with all three beams contribute effectively to the signal. the **phase - conjugate** geometry, only molecules with near-zero velocity along beam propagation direction simultaneously interact with the counterpropagat' pump **beams** and the **probe beam** for small angles of theta, giving rise to a sub-Doppler linewidth. Analytic expressions for the **phase - conjugate** line sh' have been derived in the limit of low laser intensity (7). We have...

...of the radiation, which is then directed into a uniform nonlinear medium used for optical **phase conjugation**. It was recently demonstrated by Ewart and co-workers (21) that, by using uniform laser...

...pump beams define a plane in the sample which is then intersected by a circular **probe beam** at an angle of 10 deg to 45 deg, creat' an elliptical intersection. In an...

...beam is oriented at 90 deg with respect to the forward pump b' and the **probe beam**. The generated signal beam will therefore be polarized' parallel to the backward pump, allowing efficient discrimination against th' scatter of the forward pump **beam** and **probe beam** with a polarizer.' ' An example of a single-shot image ...Initial experiments involved measurements of the sodiu' lines near 590 nm. Broadband visible light was **produced** with a "modeless" **laser** (28) with a full width at half maximum covering approximately 2 nm. T' experimental arrangement...

...long-recognize' property of DFWM, the sub-Doppler nature of the line shapes when the **phase - conjugate** geometry is used, can be used to significantly improve' spectral resolution and therefore assist in...Sandia National' Laboratories, Livermore, CA 94551.' ' REFERENCES AND NOTES' ' 1. R. A. Fisher, Ed., Optical **Phase Conjugation** (Academic Press, New York, ' 1983). ' ' 2. J. F. Reintjes, Nonlinear Optical Parametric Processes in Liquids...